



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,696	08/30/2000	Peter Ledel Gammel	18-47-1-57	2486
530	7590	06/16/2006	EXAMINER	
LERNER, DAVID, LITTENBERG, KRUMHOLZ & MENTLIK 600 SOUTH AVENUE WEST WESTFIELD, NJ 07090			PATEL, ASHOK	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/651,696	Applicant(s) GAMMEL ET AL.	
	Examiner Ashok Patel	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2879

1. Applicant's arguments with respect to claims 8-20 have been considered but are moot in view of the new ground(s) of rejection.

2. The disclosure is objected to because of the following informalities: in claim 18, the term "klystron device" is redundant. Appropriate correction is required.

3. Claims 8-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "the cathode surface" and "the grid surface", at line 9, and in claim 10, lack antecedent basis. These terms are not defined previously in the claim.

The term "the anode surface" in claim 12, lack antecedent basis.

The term "one or more flexural members" in claim 11, 13 and 14 renders the claims vague since it remains unclear as to whether the one or more flexural members of claim 11, 13 and 14 are different from that recited in claim 8. If they are same, then applicant is advised to insert the term -the-- before the term "one or more flexural members" in claims 11, 13 and 14.

Art Unit: 2879

Since language of claim 19 is similar to that of claim 8, claim 19 is also rejected for reasons set forth in the rejection of claim 8.

Claims 9 and 15-18 and 20 are necessarily rejected since they depend upon base claims 8 or 19.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 8-11, 16, 17 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (USPN 5536988, of record).

Zhang et al disclose applicant's claimed device (Figs. 1-2) including a vacuum micro-electromechanical device that includes:

Art Unit: 2879

a device substrate (12), a cathode (22) attached to the substrate having emitters, a control grid (282) attached to the device substrate (the grid controls or shapes emission of electrons emitted from the cathode), an output structure with the cathode surface and the grid surface substantially parallel and the cathode or grid attached to the device substrate by one or more flexural members (col. 5, lines 54-67).

Zhang et al do not explicitly disclose the grid being emission control grid, as claimed by applicant. However, providing the emission control grid would have been obvious to one of ordinary skill in the art to modify the control grid for focusing or modulating the emitted electrons from the emitter by varying the voltage on the grid. The change in voltage application on the grid would cause a beam of emitted electrons to expand or contract (focus) the beam, when passes through the grid.

Consequently, it would have been obvious to one of ordinary skill in the art to modify Zhang et al's device and modify the control grid for focusing or modulating the emitted electrons from the emitter by varying the voltage on the grid.

As to claim 9, Zhang et al disclose (col. 5, lines 54-67) one or more flexural members attached to the device substrate by one or more flexural members.

Art Unit: 2879

As to claim 10, Zhang et al disclose (Figure 8) the cathode and grid surfaces are substantially perpendicular to the device substrate surface.

As to claim 11, Zhang et al disclose (Figs. 1, 5) the cathode and grid surfaces are substantially perpendicular position by locking mechanisms attached to the device substrate by one or more flexural members.

Although Zhang et al do not disclose a specific dimensional limitation as recited in applicant's claims 16 and 17, applicant's such claimed dimensions would have been obvious to one of ordinary skill in the art since it has been held that where general conditions of the claim are discovered in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claims 19-20, although Zhang et al do not disclose a plurality of above-mentioned vacuum micro-electronics devices, it is known in the art to provide such plural vacuum micro-electronics devices by cascading repeating structures.

6. Claims 12-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Komatsu (USP 5,386,172).

Art Unit: 2879

Although, Zhang et al do not disclose the device including anode as claimed by applicant, providing additional electrode, such anode (also known as electron collector electrode) within the vacuum microelectronics device is well known to those skilled in the art, for collecting the emitted electrons from the emitter, or for using the device as tetrode. Also modifying the device to include multiple electrodes between cathode and anode is also known in the art to use the device as tetrode, pentode etc.

Komatsu, in the same field of endeavor, is cited for showing the vacuum microelectronics device including the additional electrode(s) (Figs. 7, 13, 14, 16, 18, 21 etc.) for the stated purpose.

Consequently, it would have been obvious to one of ordinary skill in the art to modify Zhang et al's device and include to additional electrode(s) for use as tetrode, pentode etc.

Alternatively, as to claim 18, applicant is claiming the vacuum device as triode, tetrode pentode, klystron, traveling tube. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed/used does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Art Unit: 2879

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Bower et al (USPN 6,630,772).

As to claim 15, although Zhang et al do not disclose the emitter including nanotubes, the use of carbon nanotubes is known in the art for emitting electrons. Bower et al is cited for showing the use of carbon nanotubes as emitter within the vacuum microelectronic device.

Consequently, it would have been obvious to one of ordinary skill in the art to modify Zhang et al's device to include carbon nanotubes as cathode for emitting electrons.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure..

Shaw et al, Uemura et al, Tsukamoto et al and Jin each are cited for showing a vacuum microelectronic device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashok Patel whose telephone number is 571-272-2456. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ashok Patel
Primary Examiner
Art Unit 2879